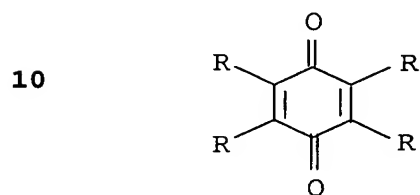


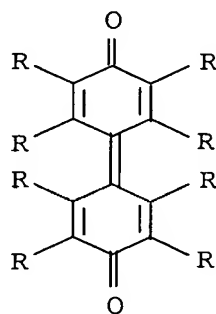
We claim:

1. A process for emulsion polymerization of one or more olefins  
 5 by reacting a ligand of the formula Ia or Ib or a mixture of  
 at least two of the ligands Ia or Ib



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Ia



Ib

- 20 in each of which R denotes one or more of the following  
 radicals:

hydrogen  
 halogen  
 25 nitrile

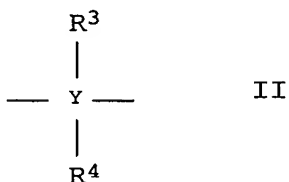
C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>1</sub>-C<sub>12</sub> alkoxy, C<sub>7</sub>-C<sub>13</sub> aralkyl, C<sub>6</sub>-C<sub>14</sub> aryl groups,  
 unsubstituted or substituted by: C<sub>1</sub>-C<sub>12</sub> alkyl groups,  
 halogens, C<sub>1</sub>-C<sub>12</sub> alkoxy, C<sub>3</sub>-C<sub>12</sub> cycloalkyl, C<sub>1</sub>-C<sub>12</sub> thioether  
 groups, carboxyl groups or sulfo groups present where  
 30 appropriate in the form of their salts, and also amino groups  
 with hydrogen and/or C<sub>1</sub>-C<sub>12</sub> alkyl radicals

amino groups NR<sup>1</sup>R<sup>2</sup>, where R<sup>1</sup> and R<sup>2</sup> together or separately are  
 hydrogen, C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>7</sub>-C<sub>13</sub> aralkyl or C<sub>6</sub>-C<sub>14</sub> aryl groups  
 35 and may additionally form a saturated or unsaturated 5- to  
 10-membered ring, unsubstituted or substituted by: C<sub>1</sub>-C<sub>12</sub>  
 alkyl groups, halogens, C<sub>1</sub>-C<sub>12</sub> alkoxy, C<sub>3</sub>-C<sub>12</sub> cycloalkyl,  
 C<sub>1</sub>-C<sub>12</sub> thioether groups, carboxyl groups or sulfo groups  
 present where appropriate in the form of their salts, and  
 40 also amino groups with hydrogen and/or C<sub>1</sub>-C<sub>12</sub> alkyl radicals

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and where identical or different compounds of the formulae Ia and Ib may where appropriate also be bridged by one or more C<sub>1</sub>-C<sub>12</sub> alkylene, C<sub>2</sub>-C<sub>12</sub> alkylated azo or formula II bridges



where Y is silicon or germanium and R<sup>3</sup> and R<sup>4</sup> are hydrogen and/or C<sub>1</sub>-C<sub>12</sub> alkyl,

with a phosphine compound PR'<sub>3</sub>, where R' is hydrogen, C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>4</sub>-C<sub>12</sub> cycloalkyl, C<sub>7</sub>-C<sub>15</sub> aralkyl or C<sub>6</sub>-C<sub>15</sub> aryl groups,

or with a diphosphine compound R'<sub>2</sub>P-G-PR'<sub>2</sub>, where R' is as defined for the phosphine compounds PR'<sub>3</sub> and G is C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>4</sub>-C<sub>12</sub> cycloalkyl, C<sub>7</sub>-C<sub>15</sub> aralkyl or C<sub>6</sub>-C<sub>15</sub> aryl groups,

and also with a metal compound of the formula M(L<sup>2</sup>)<sub>2</sub> or M(L<sup>2</sup>)<sub>2</sub>(L<sup>1</sup>)<sub>z</sub>,

where the variables are defined as follows:

M is a transition metal from groups 7 to 10 of the Periodic System of the Elements;

L<sup>1</sup> is phosphanes (R<sup>5</sup>)<sub>x</sub>PH<sub>3-x</sub> or amines (R<sup>5</sup>)<sub>x</sub>NH<sub>3-x</sub> with identical or different radicals R<sup>5</sup>, ethers (R<sup>5</sup>)<sub>2</sub>O, H<sub>2</sub>O, alcohols (R<sup>5</sup>)OH, pyridine, pyridine derivatives of the formula C<sub>5</sub>H<sub>5-x</sub>(R<sup>5</sup>)<sub>x</sub>N, CO, C<sub>1</sub>-C<sub>12</sub> alkyl nitriles, C<sub>6</sub>-C<sub>14</sub> aryl nitriles or ethylenically unsaturated double bond systems, x being an integer from 0 to 3,

R<sup>5</sup> is hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl groups, which may in turn be substituted by O(C<sub>1</sub>-C<sub>6</sub> alkyl) or N(C<sub>1</sub>-C<sub>6</sub> alkyl)<sub>2</sub> groups, C<sub>3</sub>-C<sub>12</sub> cycloalkyl groups, C<sub>7</sub>-C<sub>13</sub> aralkyl radicals, and C<sub>6</sub>-C<sub>14</sub> aryl groups,

L<sup>2</sup> is halide ions, R<sup>6</sup><sub>x</sub>NH<sub>3-x</sub>, where x is an integer from 0 to 3 and R<sup>6</sup> is C<sub>1</sub>-C<sub>12</sub> alkyl, and also C<sub>1</sub>-C<sub>6</sub> alkyl anions, allyl anions, benzyl anions or aryl anions, it being possible for L<sup>1</sup> and L<sup>2</sup> to be linked to one another by one or more covalent bonds,

z is a number from 0 to 4,

which comprises using the reaction product immediately to polymerize or copolymerize olefins in water or a solvent mixture with a water content of at least 50% by volume in the presence of an emulsifier and, optionally, of an activator.

2. A process as claimed in claim 1, wherein one or more olefins are emulsion polymerized as a miniemulsion in water, produced with the aid of ultrasound.
3. A process as claimed in claim 1 or 2, wherein an activator is used.
4. A process as claimed in any of claims 1 to 3, wherein said activator comprises olefin complexes of rhodium or of nickel.
5. A process as claimed in any of claims 1 to 4, wherein said emulsifier is based on an ionic emulsifier.
6. A process as claimed in any of claims 1 to 5, wherein one of said olefins is ethylene.
7. A process as claimed in any of claims 1 to 6, wherein one olefin is ethylene and the comonomer is selected from propylene, 1-butene, 1-hexene, and styrene.
8. A process as claimed in any of claims 1 to 7, wherein the olefin for polymerization is ethylene.
9. An aqueous dispersion of a polyolefin or copolymer of two or more olefins, obtainable as set forth in any of claims 1 to 8.
10. An aqueous dispersion of a polyethylene or ethylene copolymer, obtainable as set forth in any of claims 1 to 8.
11. An aqueous dispersion as claimed in claim 9 in the form of a miniemulsion.
12. The use of an aqueous dispersion of polyethylene as claimed in claim 10 for paper applications such as paper coating or surface sizing, paints, adhesive base materials, foam moldings such as mattresses, applications to textiles and leather, coatings on carpet backings, or pharmaceutical applications.

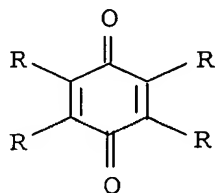
## Emulsion polymerization of olefins

## Abstract

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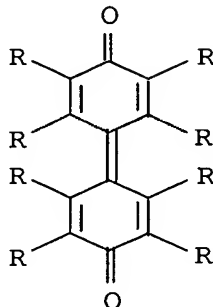
A process for emulsion polymerization of one or more olefins by reacting a ligand of the formula Ia or Ib or a mixture of at least two of the ligands Ia or Ib

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15

Ia



Ib

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in each of which R denotes one or more of the following radicals:

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25 halogen

nitrile

C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>1</sub>-C<sub>12</sub> alkoxy, C<sub>7</sub>-C<sub>13</sub> aralkyl, C<sub>6</sub>-C<sub>14</sub> aryl groups,

30 and where identical or different compounds of the formulae Ia and Ib may also be linked, where appropriate, by one or more bridges, with a phosphine compound PR<sub>3</sub>' and with a metal compound of the formula M(L<sup>2</sup>)<sub>2</sub> or M(L<sup>2</sup>)<sub>2</sub>(L<sup>1</sup>)<sub>z</sub>,

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and using the reaction product immediately to polymerize or copolymerize olefins in water or a solvent mixture with a water content of at least 50% by volume in the presence of an emulsifier and, optionally, of an activator.

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